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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,246	01/20/2004	Edward G. Sergoyan	05165.1280	7082

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BAKER & HOSTETLER LLP
Washington Square, Suite 1100
1050 Connecticut Avenue, N.W.
WASHINGTON, DC 20036

EXAMINER

KRAMSKAYA, MARINA

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

ETC

Office Action Summary	Application No. 10/759,246	Applicant(s) SERGOYAN ET AL.	
	Examiner Marina Kramskaya	Art Unit 2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>01/27/2005</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because Figure 7 contains a graph where the symbols used are lines used are unclear. Further the y-axis label "Frequency (Hz)" should read "Frequency (GHz)", based on the disclosure. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: the term "Gunplexer" appearing throughout the specification, is misspelled, and should be replaced by "Gunnplexer".

Appropriate correction is required.

Claim Objections

3. Claim 1 is objected to because of the following informalities: in line 7 of claim 1, the limitation stating, "a processing unit coupled to the amplitude detector that processes" is unclear. It is unclear if the processing unit does the "processing" or if the amplitude detector does the "processing". Appropriate correction is required.

4. Claim 3 is objected to because of the following informalities: "...signal generator is one of a Gunnplexer is or a Gunn diode" should be replaced with "...signal generator is one of a Gunnplexer or a Gunn diode". Appropriate correction is required.

5. Claim 11 is objected to because of the following informalities: "an signal detecting means" should be "a signal detecting means". Appropriate correction is required.

6. Claims 12 and 22 are objected to because of the following informalities: the term "Gunplexer", is misspelled, and should be replaced by "Gunnplexer".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 6, 9, 11, 13, 18, & 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Fathi et al., US 5,648,038.

As per Claim 1, Fathi discloses a thickness measurement system, comprising:

- an electromagnetic cavity resonator (**40** in FIG 3A-3B, **49** in text) having an exposed side;
- a signal decoupler **30** coupled to the cavity resonator **40**;
- an signal amplitude detector **35b** coupled to the decoupler;
- a frequency signal generator **20** coupled to the processing unit **50** and to the decoupler **30** (see FIG. 1);
- a processing unit **50** coupled to the amplitude detector **35b** ; and

- a correlating algorithm (i.e. analysis by processor) correlating a resonant frequency shift (i.e. intrinsic shift, as described in column 4, lines 1-2) detected by the amplitude detector **35b** to a surface thickness (i.e. property as in column 1, lines 41-44) of a sample being measured (column 4, lines 38-42).

As per Claim 11, Fathi discloses a thickness measurement system, comprising:

- a resonating means for resonating an electromagnetic signal (**40** in FIG 3A-3B, **49** in text), having an exposed side;
- a decoupler means **30** for decoupling signals from the resonating means **40**, and connected to the resonating means **40**, (via connections in FIG. 3A);
- a signal detecting means **35b** for detecting an amplitude of signals from the decoupler means **30**, and connected to the decoupler means (via connections in FIG. 3A);
- a frequency signal generating means **20** for generating frequency signals, coupled to the processing means **50** and the decoupler means **30** (via connections in FIG. 3A); and
- a processing means **50** for processing, coupled to the signal detecting means **35b** (via connections in FIG. 3A), or having;
- correlating means (in **50**, i.e. analysis by processor) for correlating a resonant frequency shift (i.e. intrinsic shift, as described in column 4, lines 1-2) detected by the detecting means **35b** to a surface thickness (i.e. property as in column 1, lines 41-44) of a sample being measured (column 4, lines 38-42).

As per Claims 2 & 13, Fathi discloses the thickness measurement system as applied to Claims 1 & 11 above, and further discloses the electromagnetic cavity resonator having a plurality of cavities (cavities: **40a**, **40b**, **40c**; column 5, lines 41-42).

As per Claims 6 & 18, Fathi discloses the thickness measurement system as applied to Claims 1 & 11 above, and further discloses the amplitude detector **35b** that detects a power (reflected power, P_r).

As per Claims 9 & 20, Fathi discloses the thickness measurement system as applied to Claims 1 & 11 above, and further discloses the processing unit **50** to be a personal computer (COMPUTER in FIG. 3A; column 4, line 42).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 3, 5, 7, 10, 12, 15, 17, 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fathi in view of Little Jr., US 6,359,446.

As per Claims 3 ,12 & 15, Fathi discloses the thickness measurement system as applied to Claims 1 & 11 above.

Fathi does not disclose the frequency signal generator in the measurement system to be one of a Gunnplexer or a Gunn Diode.

Little discloses a non-conductive thin film thickness measurement system (see ABS.), wherein the frequency signal generator is a Gunnplexer (column 4, lines 40-43). Little further discloses the Gunnplexer to be made of a Gunn Diode (column 4, lines 42-43).

Therefore, it would have been obvious to a person of ordinary skill in the art to Gunnplexer frequency signal generator, as taught by Little, in the measurement system of Fathi, because a Gunnplexer is small and efficient (column 4, lines 40-43).

As per Claims 5 & 17, Fathi discloses the thickness measurement system as applied to Claims 1 & 11 above.

Fathi does not disclose the amplitude detector that detects a voltage.

Little discloses a measurement system wherein the amplitude detector detects a voltage (column 5, lines 21-24).

Therefore, it would have been obvious to a person of ordinary skill in the art to use the amplitude detector to detect a voltage, as taught by Little, in the measurement system of Fathi, in order to send the voltage signal to the signal processor for analysis of the properties for the test material.

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As per Claims 7 & 19, Fathi discloses the thickness measurement system as applied to Claims 1 & 11 above.

Fathi does not disclose a DC supply coupled to the frequency generator.

Little discloses a DC supply coupled to the frequency generator (column 6, lines 7-11).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a DC power supply coupled to the frequency generator, as taught by Little, in the measurement system of Fathi, in order to deliver power to the frequency generator (column 6, lines 10-11).

As per Claim 8, Fathi discloses the thickness measurement system as applied to Claim 1 above.

Fathi does not disclose a varactor DC supply capable of controlling a frequency generator output frequency.

Little discloses using a varactor (column 4, lines 46-48) DC supply (column 4, lines 59-60) capable of controlling (i.e. tuning) a frequency generator (Gunnplexer) output frequency.

Therefore, it would have been obvious to a person of ordinary skill in the art to use a varactor, as taught by Little, in the measurement system of Fathi, in order to tune the frequency generator, in the instant case a Gunnplexer.

Regarding claims 10 & 21, hereafter, based on the specification, the examiner interprets the "natural resonant frequency" to be the preset frequency of the frequency generator at approximately 10.6 GHz.

As per Claims 10 & 21, Fathi discloses the thickness measurement system as applied to Claims 1 & 11 above.

Fathi does not disclose the cavity resonator to be resonant at a natural frequency of approximately 10.6 GHz.

Little discloses the frequency generator (Gunnplexer) preset to 10 GHz (column 4, lines 50-53).

Therefore, it would have been obvious to a person of ordinary skill in the art to have a generator set to a frequency of 10 GHz, as taught by Little, in the measurement system of Fathi, in order to test the properties of the material responsive to the set frequency.

11. Claims 4 & 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fathi in view of Dorothy et al., US 5,563,505.

Fathi discloses the thickness measurement system as applied to Claim 1 above.

Fathi does not disclose a suction assembly that applies pressure to the cavity resonator to retain it upon the measurement sample.

Dorothy discloses a suction assembly that applies pressure to the cavity resonator (180, opening of the resonator) to retain it upon the measurement sample (i.e. film), (column 9, lines 52-56).

Therefore, it would have been obvious to a person of ordinary skill in the art to use suction, as taught by Dorothy, in the measuring device of Fathi, in order to hold the sample in place.

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fathi in view of Little, and further in view of the Electrical Engineering Dictionary (reference provided).

Fathi discloses the thickness measurement system as applied to Claim 11.

Fathi does not disclose a thickness measuring system, wherein the frequency signal generating means has Schottky diodes.

Little discloses a thickness measuring system, wherein the frequency signal generating means has a varactor. The Electrical Engineering Dictionary defines a varactor as comprising of Schottky diodes.

Therefore, it would have been obvious to a person of ordinary skill in the art to use a varactor comprising of a Schottky diode, as taught by Little, in the measurement system of Fathi, in order to tune the frequency generator, in the instant case a Gunnplexer.

13. Claims 22 & 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson , US 6,184,694, in view of Little Jr. and Fathi.

Anderson discloses a method for thickness measurement, comprising the steps of:

- abutting an open faced (see FIG. 3D) electromagnetic cavity resonator (**CV1**) to a sample having a film thickness (DRY FILM THICKNESS: FIG.3C);
- sweeping frequencies in the cavity resonator (see FIG. 6)
- determining the thickness of the film from a correlation of frequency to thickness (FIG. 6).

Anderson does not disclose:

- using a signal generator having a Gunnplexer;
- detecting a resonant frequency of the cavity resonator using a reflected energy detector; and
- determining the thickness of the film from a correlation of a shift of the resonant frequency.

Little discloses:

- using a signal generator having a Gunnplexer (column 4, lines 40-42);
- detecting a resonant frequency of the cavity resonator using a reflected energy detector (column 5, lines 17-19).

Fathi discloses determining the thickness of the film from a correlation (by **50**) of a shift of the resonant frequency (i.e. intrinsic shift, as described in column 4, lines 1-2).

Therefore, it would have been obvious to a person of ordinary skill in the art use a Gunnplexer, detecting a resonant frequency of the cavity resonator using a reflected energy detector, and determining the thickness of the film from a correlation of a shift of the resonant frequency, as taught by Little and Fathi, in the measurement system of Anderson, in order to

As per Claim 23, Anderson discloses the method of thickness measurement as applied to Claim 22 above, and further discloses the method wherein the correlation is based on a first order equation (see FIG. 6).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lunden, US 6,297,648, discloses a thickness measurement system utilizing a cavity resonator.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Kramskaya whose telephone number is (571)272-2146. The examiner can normally be reached on M-F 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571)272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MK


ANJAN DEB
PRIMARY EXAMINER

Marina Kramskaya
Examiner
Art Unit 2858

